

Bagian : QC

Due date : 10 - Sep - 26

Tanggal : 30 - Jul - 26

ANALISA PERMINTAAN BARANG

No	Kode Barang	Nama Barang	Satuan	Stok Saat Ini (A)	Rencana Kebutuhan (B)	Kekurangan (A -B + C)	Pending Penerimaan (C)	Jumlah	Realisasi Pembelian	Realisasi Penggunaan
1	IMO16408	pH Sensor In-Lab Expert GO-ISM ex. Mettler Toledo	Un	0	1	-1	0	1	0	0

Catatan :

pH Sensor Inlab Expert Go-ISM, Cat. No: 51344102 Ex. Mettler Toledo

- Digunakan sebagai sensor utama untuk mendeteksi aktivitas ion hidrogen, mengukur tegangan listrik dan mengubahnya menjadi nilai derajat keasaman atau kebasaan (pH) suatu cairan sampel.

- Pemesanan terakhir bulan Oktober 2025 (PW025462)

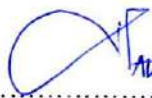
- Estimasi harga Rp.10,039.000/Unit

Latar belakang pemesanan :

- pH sensor (elektroda) merupakan consumable part yang digunakan setiap hari dan perlu diganti secara berkala berdasarkan performa pembacaan alat pH meter. Saat ini pH meter yang berada di laboratorium kimia Lt. 2 gedung office dengan No. Inventaris: C62.001/D.09/RD/INST/04/16 sudah habis masa pakainya dengan hasil offset tidak memenuhi spesifikasi yaitu 32.8 mV sedangkan syarat offset menurut kompendial adalah 30 mV, maka dari itu diperlukan pemesanan untuk penggantian part tersebut guna menunjang kegiatan analisa di laboratorium kimia.

Print hasil verifikasi pH meter, USP terkini, IK pemeliharaan pH meter, kartu perbaikan mesin dan penawaran harga.

Dibuat

 30/26
Adm 07

Mengetahui


Antamb

S.(B1/B2): -57.82mV/pH

Slope[%]: 97.7%

Off.(B1/B2): -31.8mV

B3(25°C): 9.21pH

mV3: -162.0mV

Temp.3: 21.6°C ATC

S.(B2/B3): -58.68mV/pH

Slope[%]: 99.2%

Off.(B2/B3): -31.8mV

Segmented

Auto EP Medium

Signature:_____

14-Jul-2026

07:46

ExpertGoISM

5041660

B1(25°C): 4.01pH

mV1: 140.4mV

Temp.1: 22.0°C ATC

B2(25°C): 7.00pH

mV2: -32.4mV

Temp.2: 22.5°C ATC

S.(B1/B2): -58.06mV/pH

Slope[%]: 98.1%

Off.(B1/B2): -31.8mV

B3(25°C): 9.21pH

mV3: -160.7mV

Temp.3: 22.7°C ATC

S.(B2/B3): -58.14mV/pH

Slope[%]: 98.3%

Off.(B2/B3): -31.8mV

Segmented

Auto EP Medium

Signature:_____

15-Jul-2026

07:51

ExpertGoISM

5041660

B1(25°C): 4.01pH

mV1: 139.9mV

Temp.1: 21.7°C ATC

B2(25°C): 7.00pH

mV2: -33.4mV

Temp.2: 22.6°C ATC

S.(B1/B2): -58.29mV/pH

Slope[%]: 98.5%

Off.(B1/B2): -32.8mV

B3(25°C): 9.21pH

mV3: -161.7mV

pH sensor Calibration – indicating sensor condition

The sensor calibration provides valuable data on the sensor condition

- **Offset value (mV)** – indicates the age of electrode and provides an estimation when the electrode need to be change
- **Calibration Slope (%)** – indicates the sensitivity of the glass membrane
- USP <791> requirement 90 -105% slope and offset 0 ± 30 mV (0.5 pH units at 25° C).



Calibration Data

24-Sep-2019

06:56 AM

ExpertPro-ISM

B1(25C): 4.01 pH

mV1: 180.3 mV

Temp 1: 26.9 °C ATC

B2(25C): 7.00 pH

mV2: 9.5 mV

Temp 2: 26.5 °C ATC

Slope: -58.33 mV/pH

Slope[%]: 98.6%

Offset: 9.5 mV

Linear

Auto EP Medium



Slope: 95-105%

Offset: $\pm(0-20)$ mV

Electrode is in good condition



Slope: 94-90%

Offset: $\pm(20-35)$ mV

Electrode needs cleaning



Slope: 89-85%

Offset: $\pm(>35)$ mV

Electrode is faulty

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<791> pH

INTRODUCTION

For compendial purposes, pH is defined as the value given by a suitable, properly calibrated, potentiometric sensor and measuring system. [NOTE—The measuring system has traditionally been referred to as the “pH meter.” While the pH meter is still in common use, the measuring system can also be embedded inside the pH sensor, and the pH signal can be transmitted digitally to an external device such as a computer, Programmable Logic Controller (PLC), Distributed Control System (DCS), data acquisition system, terminal, or other microprocessor-controlled device.] By definition, pH is equal to $-\log_{10}[a_{\text{H}^+}]$ where a_{H^+} is the activity of the hydrogen (H^+) or hydronium ion (H_3O^+), and the hydrogen ion activity very closely approximates the hydrogen ion concentration.

The practical pH scale is defined:

$$\text{pH} = \text{pH}_s + [(E - E_s)/k]$$

E = measured potential where the galvanic cell contains the solution under test (pH)

E_s = measured potential where the galvanic cell contains the appropriate buffer solution for calibration (pH_s)

k = change in potential/unit change in pH and is derived from the Nernst equation (as follows)

$$k = \log_e(10) \times (RT/nF)$$

R = 8.314 J/mole/°K

T = temperature (°K)

n = moles/half-reaction

F = Faraday constant, 96485 C/mole

The resulting equation is $[0.05916 + 0.0001984(T - 25^\circ)]$ volts at temperature T . Values of k from 15°–35° are provided in [Table 1](#).

Table 1. Values of k for Various Temperatures

Temperature (°C)	k (V)
15.00	0.05718
20.00	0.05817
25.00	0.05916
30.00	0.06016
35.00	0.06115

Values of k at other temperatures can be determined from the equation above. For practical purposes, values of k are determined from pH sensor calibration.

PH MEASUREMENT SYSTEM

The measurement system consists of 1) a measuring electrode sensitive to hydrogen-ion activity, typically a glass electrode, though other electrode types are possible; 2) a suitable reference electrode, for example, a silver–silver chloride electrode; and 3) a voltage measurement system with an input resistance capable of measuring at a high input impedance of the pH sensor. The measuring and reference electrode may be separated or combined. The voltage measurement system may be separated from the pH sensor or integrated into the sensor. For most applications, a temperature measurement will be necessary for compensation of the Nernst temperature influence described above. A temperature device may be embedded into the pH sensor, or an external temperature device may be used.

INSTRUMENT REQUIREMENTS

The measurement system shall be capable of performing a two-point (or more) pH calibration (see below). The accuracy of the pH measurement system is described in the *Calibration* section. The resolution of the pH measurement system shall be at least 0.01 pH. The instrument shall be capable of temperature-compensating the pH sensor measurement to convert the millivolt signal to pH units at any temperature, either automatically using a temperature device built into the sensor system or by manual entry of the sample temperature into the measurement system. The accuracy of the temperature measurement system shall be $\pm 1^\circ$. The resolution of the temperature measurement system shall be at least 0.1°. Lab-based pH measurements are typically performed at $25 \pm 2^\circ$ unless otherwise specified in the individual monograph or herein. However, temperatures outside this range are acceptable if samples are more conveniently prepared at alternative temperatures. Examples of non-lab-based measurements include test samples inside process pipes, vessels, tanks, and other non-standard processing conditions. [NOTE—The definitions of pH, the pH scale, and the values assigned to the buffer solutions for calibration are for the purpose of establishing a practical, operational system so that results may be compared between laboratories. The measured pH values do not necessarily correspond exactly to those obtained by the definition, $\text{pH} = -\log_{10} [a_{\text{H}^+}]$, rather the values obtained are closely related to the activity of the hydrogen-ion in aqueous solutions.][NOTE—Where a pH measurement system is calibrated by use of an aqueous buffer and then used to measure the pH of nonaqueous systems, the ionization constant of the acid or base, the dielectric constant of the medium, the liquid-junction potential (which may give rise to errors of approximately 1 pH unit), and the hydrogen-ion response of the glass electrode are all changed. For these reasons, the values so obtained with solutions that are only partially aqueous in character can be regarded only as apparent pH values.]

BUFFER SOLUTIONS FOR CALIBRATION OF THE PH MEASUREMENT SYSTEM

Buffer solutions for calibration are prepared as directed in [Table 2](#).¹ Buffer salts of requisite purity can be obtained from the National Institute of Standards and Technology (NIST), other national authorities, or other suppliers. Buffer solutions should be stored in appropriate containers that ensure stability of the pH through the expiry date, and fitted with a tight closure. For buffer solutions greater than 11, the storage should be in containers that are resistant to or reduce carbon dioxide intrusion, which would lower the pH of the buffer. For buffer solutions lower than 11, they should typically be prepared at intervals not to exceed 3 months. For buffer solutions greater than 11, they should typically be prepared and used fresh unless carbon dioxide ingress is restricted. All buffer solutions should be prepared using [Purified Water](#). [Table 2](#) indicates the pH of the buffer solutions as a function of temperature. The instructions presented here are intended for the preparation of solutions having the designated molal (m) concentrations. However, in order to facilitate their preparation, the instructions are given in molarity. The difference in concentration between molality and molarity preparations for these buffer solutions is less than 1%, and the pH difference is negligible. Calibration using buffer solutions shall be done in the temperature range of the buffers listed in [Table 2](#). [NOTE—The Nernst temperature compensation corrects only for the electrode millivolt output change with temperature, not the actual pH change of the buffer solution with temperature, which is unique for each buffer.] Features such as automatic buffer recognition or buffer pH–temperature correction are available for convenience in accommodating the temperature influence on buffer solutions. The pH–temperature response can be determined from the values in [Table 2](#).

Table 2. pH Values of Buffer Solutions for Calibration

Temperature (°C)	Potassium Tetra- oxalate, 0.05 m	Potassium Hydrogen Tartrate, Saturated at 25°	Potassium Dihydroge n Citrate, 0.05 M	Potassium Biphthalat e, 0.05 m	Equimolal Phosphate , 0.05 m	Potassium Dihydroge n Phosphate , 0.0087 M and Disodium Hydrogen Phosphate , 0.0303 M	Sodium Tetraborat e, 0.01 m	Sodium Carbonate, 0.025 M and Sodium Bicarbonat e, 0.025 M	Calcium Hydroxide, Saturated at 25°
10	1.67	—	—	4.00	6.92	—	9.33	—	13.00
15	1.67	—	3.80	4.00	6.90	7.45	9.28	10.12	12.81
20	1.68	—	3.79	4.00	6.88	7.43	9.23	10.06	12.63
25	1.68	3.56	3.78	4.01	6.86	7.41	9.18	10.01	12.45
30	1.68	3.55	3.77	4.02	6.85	7.40	9.14	9.97	12.29
35	1.69	3.55	3.76	4.02	6.84	7.39	9.10	9.93	12.13
40	1.69	—	—	4.04	6.84	—	9.07	—	11.98
45	1.70	—	—	4.05	6.83	—	9.04	—	11.84
50	1.71	—	—	4.06	6.83	—	9.01	—	11.71
55	1.72	—	—	4.08	6.83	—	8.99	—	11.57
60	1.72	—	—	4.09	6.84	—	8.96	—	11.45
$\Delta\text{pH}/\Delta^\circ\text{C}$	0.0010	-0.0014	-0.0022	0.0018	-0.0016	-0.0028	-0.0074	-0.0096	-0.0310

Preparation of alternative volumes at the same concentrations to those indicated below is acceptable.

Potassium tetraoxalate, 0.05 m: Dissolve 12.61 g of $\text{KH}_3(\text{C}_2\text{O}_4)_2 \cdot 2\text{H}_2\text{O}$, and dilute with water to make 1000.0 mL.

Potassium hydrogen tartrate, saturated at 25°: Add $\text{C}_4\text{H}_5\text{KO}_6$ to water until saturation is exceeded at 25°. Then filter or decant.

Potassium dihydrogen citrate, 0.05 M: Dissolve 11.41 g of $\text{C}_6\text{H}_7\text{KO}_4$, and dilute with water to make 1000.0 mL.

Potassium biphthalate, 0.05 m: Dissolve 10.12 g of $\text{KHC}_8\text{H}_4\text{O}_4$, previously dried at 110° for 1 h, and dilute with water to make 1000.0 mL.

Equimolal phosphate, 0.05 m: Dissolve 3.53 g of disodium hydrogen phosphate (Na_2HPO_4) and 3.39 g of potassium dihydrogen phosphate (KH_2PO_4), each previously dried at 120° for 2 h, and dilute with water to make 1000.0 mL.

Potassium dihydrogen phosphate, 0.0087 M and disodium hydrogen phosphate, 0.0303 M: Dissolve 1.18 g of KH_2PO_4 and 4.30 g of Na_2HPO_4 , both dried for 2 h at $120 \pm 2^\circ$, and dilute with water to make 1000.0 mL.

Sodium tetraborate, 0.01 m: Dissolve 3.80 g of $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$, and dilute with water to make 1000.0 mL. Protect from absorption of carbon dioxide.

Sodium carbonate, 0.025 M and sodium bicarbonate, 0.025 M: Dissolve 2.64 g of sodium carbonate (Na_2CO_3) and 2.09 g of sodium bicarbonate (NaHCO_3), and dilute with water to make 1000.0 mL.

Calcium hydroxide, saturated at 25°: Add $\text{Ca}(\text{OH})_2$ to water until saturation is exceeded at 25°. Use water that has been recently boiled and protected from the atmosphere to limit carbon dioxide absorption. Then filter or decant.

Change to read:

CALIBRATION

Because of variations in the nature and operation of the available pH measurement systems, it is not practical to provide universal directions for the calibration of the measurement system. However, the general principles to be followed are set forth in the following paragraphs. Examine the electrodes, especially the reference electrode and electrolyte level, if a liquid electrolyte is used. If necessary, replenish electrolyte supply, and observe other precautions indicated by the instrument and electrode manufacturers.

The calibration or verification of the pH measurement system should be periodically executed. The historical performance of the measurement system, the criticality of the pH measurement, the maintenance of the pH sensor, and the frequency of measurement operation are used to determine the frequency of the calibration/verification.

▲ The procedure below allows for several calibration methodologies (two-point calibration, multiple-point calibration, and multiple-segment calibration). ▲ (USP 1-Aug-2020)

If the pH of the buffer is sensitive to ambient carbon dioxide, then use [Purified Water](#) that has been recently boiled, and subsequently stored in a container designed to minimize ingress of carbon dioxide.

1. To calibrate the pH measurement system, select three buffer solutions for calibration, preferably from those given in [Table 2](#), such that the expected pH of the material under test falls within their range. Two of the buffers are used for the calibration process, and the third buffer is used for verification. The value of the verification buffer shall be between two of the calibration buffers. If the operational range of the pH sensor is beyond the pH range of the buffer solutions in [Table 2](#), then either 1) select two nearby pH buffers from [Table 2](#) or 2) select one from [Table 2](#) and another documented prepared buffer that is outside the range.
2. Rinse the pH sensor several times with water, then with the first buffer solution.
3. Immerse the pH sensor in the first buffer solution at a temperature within the range of [Table 2](#).
4. If automatic temperature measurement and compensation are not included in the measuring system, manually enter the temperature of the buffer and pH value of the buffer solution at that temperature into the instrument. For temperatures not listed in [Table 2](#), use linear interpolation to determine the pH value as a function of temperature.
5. Initiate the two-point calibration sequence with the first buffer according to the manufacturer's instructions.
6. Remove the pH sensor from the first buffer and rinse the electrode(s) with water, and then with the second buffer solution.
7. Immerse the pH sensor in the second buffer at a temperature within the range of [Table 2](#).
8. If automatic temperature measurement and compensation are not included in the measuring system, manually enter the temperature of the buffer and pH value of the buffer solution at that temperature into the instrument.
9. Continue the two-point calibration sequence with the second buffer according to the manufacturer's instructions.
10. After completion of the two-point calibration process, verify that the pH slope and offset are within acceptable parameters. **Typical acceptable parameters are a slope of 90%–105% and an offset of 0 ± 30 mV (0.5 pH units at 25°).** Depending on the pH instrumentation, the pH slope and offset may be determined in software or by manual methods. If using manual methods, follow supplier instructions to calculate the pH sensor slope/offset. If these parameters are not within acceptable parameters, the sensor should be properly cleaned, replenished, serviced, or replaced, and the two-point calibration process shall be repeated.
11. Remove the pH sensor from the second buffer, and rinse thoroughly with water, and then the verification buffer.
12. Immerse the pH sensor in the verification buffer at a temperature within the range of [Table 2](#).
13. If automatic temperature measurement and compensation are not included in the measuring system, manually enter the temperature of the buffer and pH value of the buffer solution at that temperature into the instrument.
14. The pH reading shall be within ± 0.05 pH of the value in [Table 2](#) at the buffer solution temperature.

▲ Note—If a multiple-point calibration process (three or more calibration buffers) plus at least one verification buffer are used, then repeat steps 9–14, assuring that the pH sensor slope and offset criteria (see step 10) and the calibration accuracy (see step 14) of this range are met. The value of the verification buffers shall be between the highest and lowest calibration buffers of the range.

Note—If a multiple-segment calibration process (three or more calibration buffers with at least two slopes and offsets) plus at least one verification buffer for each segment are used, then repeat steps 9–14 for each segment, assuring that the pH sensor slope and offset criteria (see step 10) and the calibration accuracy (see step 14) of each segment are met. The value of each verification buffer shall be between the highest and lowest calibration buffers for each segment. ▲ (USP 1-Aug-2020)

OPERATION

All test samples should be prepared using [Purified Water](#), unless otherwise specified in the monograph. All test measurements should use manual or automated Nernst temperature compensation.

1. Prepare the test material according to requirements in the monograph or according to specific procedures. If the pH of the test sample is sensitive to ambient carbon dioxide, then use [Purified Water](#) that has been recently boiled, and subsequently stored in a container designed to minimize ingress of carbon dioxide.

Handwritten signature and date:
09/25/10

2. Rinse the pH sensor with water, then with a few portions of the test material.

3. Immerse the pH sensor into the test material and record the pH value and temperature.

In all pH measurements, allow sufficient time for stabilization of the temperature and pH measurement.

Diagnostic functions such as glass or reference electrode resistance measurement may be available to determine equipment deficiencies. Refer to the electrode supplier for diagnostic tools to assure proper electrode function.

Where approximate pH values suffice, indicators and test papers (see [Reagents, Indicators, and Solutions—Indicators and Indicator Test Papers, Indicators](#) and [Indicator and Test Papers](#)) may be suitable.

For a discussion of buffers, and for the composition of standard buffer solutions called for in compendial tests and assays, see [Reagents, Indicators, and Solutions—Solutions, Buffer Solutions](#). This referenced section is not intended to replace the use of the pH calibration buffers in [Table 2](#).

¹ Commercially available buffer solutions for pH measurement system, calibrated by methods traceable to NIST or other national authorities, labeled with a pH value accurate to 0.02 pH units may be used. Solutions prepared from ACS reagent-grade materials or other suitable materials, may be used provided the pH of the resultant solution is the same as that of the solution prepared from the NIST (or other national authorities)-certified material. Buffer solutions that are greater than 12 should be used immediately or should be prepared using freshly boiled water, and they should be stored under conditions to minimize carbon dioxide absorption and ingress.

Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
<791> PH	Antonio Hernandez-Cardoso Senior Scientific Liaison	GCCA2020 General Chapters - Chemical Analysis 2020

Most Recently Appeared In:

Pharmacopeial Forum: Volume No. 49(2)

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INSTRUKSI KERJA

PENGUNAAN, PEMBERSIHAN DAN PEMELIHARAAN ALAT pH METER

MEREK METTLER TOLEDO TIPE S220

DEPARTEMEN
QUALITY CONTROL

SEKSI
KIMIA

Halaman : 2 dari 4

No. Dokumen : QC.1-IK/04.019.00

Tanggal Berlaku : 14 AUG 2024

Masa berlaku s/d : 14 AUG 2025

Menggantikan No : QC.1-PT/061.01

- 5.1.2.4. Pastikan sebelum alat digunakan setiap hari dilakukan verifikasi dengan menggunakan larutan *Buffer Solution*.
- 5.1.2.5. Segera setelah menggunakan alat, bersihkan bagian luar dan dalam elektroda dengan *purified water* kemudian elektroda dengan tissue.
- 5.1.2.6. Data pengukuran yang disimpan di alat maksimum 1000 data.
- 5.1.3. Petunjuk Verifikasi



- 5.1.3.1. Tekan tombol  untuk mengoperasikan alat.
- 5.1.3.2. Siapkan larutan buffer 4.00 ; larutan buffer 7.00 dan larutan buffer 9.00.
- 5.1.3.3. Angkat elektroda dari botol / wadah yang berisi larutan KCl 3M kemudian bilas sensor elektroda dengan menggunakan botol semprot berisi *purified water*. Keringkan sensor elektroda dengan kain bebas serat secara hati-hati.

- 5.1.3.4. Masukkan sensor elektroda ke dalam larutan buffer pH 4.00 kemudian tekan .

Pada display alat, titik akhir verifikasi akan muncul tulisan . Angkat elektroda, bilas sensor elektroda dengan menggunakan botol semprot berisi *purified water*. Keringkan sensor elektroda dengan kain bebas serat secara hati-hati.

- 5.1.3.5. Masukkan elektroda ke dalam larutan buffer pH 7.00 kemudian tekan . Pada

display alat, titik akhir verifikasi akan muncul tulisan . Angkat elektroda, bilas sensor elektroda dengan menggunakan botol semprot berisi *purified water*. Keringkan sensor elektroda dengan kain bebas serat secara hati-hati.

- 5.1.3.6. Masukkan elektroda ke dalam larutan buffer pH 9.00 kemudian tekan . Pada

display alat, titik akhir verifikasi akan muncul tulisan .

- 5.1.3.7. Evaluasi hasil verifikasi dengan melihat nilai *Slope* dan nilai *Offset* sebagai berikut:

<i>Slope</i>	<i>Offset</i>	Keterangan
90 – 105 %	± 30 mV	Elektroda dalam kondisi baik

Jika nilai keluar dari range lakukan perendaman elektroda dalam HCl 0,1 M selama 6 jam kemudian bilas dan rendam kembali 30 menit dalam larutan buffer pH 7.00, lakukan verifikasi ulang.

- 5.1.3.8. Catat nilai *slope* dan nilai *offset* dalam Logbook Alat pH Meter Mettler Toledo.
- 5.1.3.9. Jika sudah selesai angkat elektroda dari larutan *buffer*, bilas sensor elektroda dengan menggunakan botol semprot berisi *purified water*. Keringkan sensor elektroda dengan kain bebas serat secara hati-hati. Celupkan elektroda ke dalam botol berisi KCl 3M.

- 5.1.4. Pengukuran pH Sampel



- 5.1.4.1. Tempatkan sensor elektroda pada sampel dan tekan tombol  untuk memulai pengukuran.

- 5.1.4.2. Pada display alat, titik akhir pengukuran jika otomatis akan muncul tulisan  (kondisi manual tekan tombol 'Read'). Catat nilai pH dan suhu yang terbaca pada alat pH meter dalam logbook dan lampirkan jika ada print out.

- 5.1.4.3. Angkat elektroda dan bilas sensor elektroda dengan menggunakan botol semprot berisi *purified water*. Keringkan sensor elektroda dengan kain bebas serat secara

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09/25

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PT. MERSIFARMA TM.
DIVISI MANUFACTURING
SUKABUMI-INDONESIA

KARTU PERBAIKAN/SERVICE MESIN

No. Dokumen : 2TK00/FORMU/009.00
Berlaku Tanggal : 17 Oktober 2012
Dibuat Oleh : SDK

NAMA MESIN : p1 Meter, Se Ven Compact
NO MESIN : B60 3011421
NO INVENTARIS : C62001/D-09/ROINST/04/16
MANUFACTURER : Mettler Toledo
TYPE : S220
KAPASITAS :

NEGARA ASAL : Switzerland
TAHUN PEMBUATAN : April 2016
PEMBELIAN : PT. Mettler Toledo
SUPLIER : lab. Central, Purno Preparasi
LAIN-LAIN :

NO	TANGGAL	KERUSAKAN	PERBAIKAN	WAKTU		PARAF		KET
				Perkiraan	Realisasi	Opt	SPV	
1	09/10/20	Kalibrasi	-	11:00	13:30	Ariel	-	-
2	14.09.23	Kalibrasi	-	10:00	13:00	Ngoren	3	mit
3	02. Jan 25	Verifikasi	Penggantian	10:00	10:30	P. Ihsan	3	Rekomendasi:
		tidak memenuhi	unit				3	- penggantian
		syarat offset						elektrode
		(0 ± 30 mV)						
	20/01/25	nilai -33,2 mV						
4	18 Feb 25	Nilai offset	Penggantian	21:00	21:00	P. Ihsan	3	
	(kedatangan	dan slope	elektrode baru				3	
	elektrode)	tidak memenuhi						
		syarat.						
5	03 Oktober 25	Verifikasi dan	Pengecekan Elemtrode	08:00	09:00	-	3	Rekomendasi:
		Kalibrasi dan	dari offset					- penggantian elektrode
		memenuhi syarat						
		offset (± 30mV)						
6	29.10.2025	Kalibrasi		11:00	13:00	3	3	Rekomendasi:
								- Port temperature berhalut
								menyebabkan pembacaan
								temperature terganggu.
								direkomendasikan mengganti
								part main board.
7	20 Juli 2026	Verifikasi harian	Treatment elek	NA	08:30 - 16:00	NA	3	Rekomendasi:
		tidak memenuhi	trode, cek slope					Penggantian elek
		syarat offset	& offset					troda
		& Slope						

Mengetahui,

Petugas

Manager Teknik

Print Date 31.07.2024
Customer 302259208
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PT METTLER TOLEDO INDONESIA

Address Gedung Grha Persada Lt. 2 Unit D2
Jl KH Noer Ali No.3A RT 002 RW 026, Kayuringin Jaya
Bekasi Selatan, Kota Bekasi, Jawa Barat 17144
Telephone +62 21 2945 3919
CO. Regn No 8120109841858
NPWP Regn No 70.049.973.4-432.000

www.mt.com

Quotation 323354190

Item	Description	Product ID	Qty	Unit	Price per Unit	Total (IDR)
20	pH Sensor InLab® Expert Go-ISM A combination pH electrode with integrated temperature probe, PEEK shaft, fixed cable and ISM. Designed for portable applications in the lab and outdoor; robust and maintenance-free. Measuring range: pH 0 – 14 Type of junction: Open junction Sensor Type: Combined electrode	51344102	1	EA	10,039,000	10,039,000

Origin of Precision

IP67 - For a water-proof measurement

Ensures your entire portable measuring system (Seven2Go meter and InLab sensor) is able to withstand wet and demanding environments.

For the toughest conditions

PEEK shaft with excellent chemical and mechanical resistance, a real heavy-duty sensor.

Junction-Free, Worry-Free

Thanks to the solid XEROLYT® reference electrolyte, no membrane junction is needed. No junction, no clogging.

For more Details: www.mt.com/InLab

Total (Excluding VAT, IDR)	26,526,000
Total VAT (11%)	2,917,860
Total (Inclusive VAT, IDR)	29,443,860

Handwritten signature and date: 02/25/2025

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World Trade Center I Jl. Jend Sudirman Kav 29-31
Jakarta 12920 - INDONESIA
PT METTLER TOLEDO INDONESIA
A/C Name
A/C No. IDR 050-194562-068
A/C No. USD 050-194562-115
SWIFT Code HSBCIDJA
Bank Code 087

METTLER TOLEDO